



PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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A.W.

In re application of

Docket No. A8487

RECEIVED

NAKAMURA, Lee E., et al.

MAR 10 2004

Appln. No. 09/637,381

Group Art Unit: 2177

Technology Center 2100

Confirmation No. 8892

Examiner: Harold E. Dodds

Filed: August 11, 2000

For: DATA ACCESS SYSTEM

SUBMISSION OF APPELLANT'S BRIEF ON APPEAL

MAIL STOP APPEAL BRIEF - PATENTS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith please find an original and two copies of Appellant's Brief on Appeal. A check for the statutory fee of \$330.00 is attached. The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account. A duplicate copy of this paper is attached.

Respectfully submitted,

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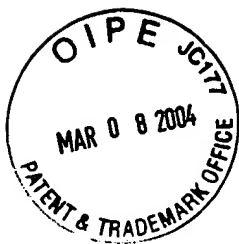
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CUSTOMER NUMBER

Date: March 8, 2004



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APPELLANTS' BRIEF ON APPEAL UNDER 37 C.F.R. § 1.192

MAIL STOP APPEAL BRIEF - PATENTS

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 37 C.F.R. § 1.192, Appellants submit that the following comprises the Appellants' Brief on Appeal from the Office Action dated October 8, 2003, wherein claims 1-24 and 76-81 were finally rejected. This Appeal Brief is being filed in triplicate and is accompanied by a Submission which includes the required appeal fee set forth in 37 C.F.R. § 1.17(c). Appellants' Notice of Appeal was filed on January 6, 2004. Therefore, the present Appeal Brief is timely filed.

I. REAL PARTY IN INTEREST

The real party in interest is International Business Machines Corporation ("IBM") of Armonk, New York, the assignee.

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II. RELATED APPEALS AND INTERFERENCES

In related Application No. 10/145,543, a divisional of the present application, Appellants filed a Notice of Appeal on July 14, 2003 and an Appeal Brief¹ on September 15, 2003, to appeal the final rejection of claims 25-51 and 76-81 in the Office Action dated April 14, 2003.

In related Application No. 10/145,544, a divisional of the present application, Appellants filed a Notice of Appeal on July 25, 2003 and an Appeal Brief² on September 25, 2003, to appeal the final rejection of claims 52-60 and 76-81 in the Office Action dated April 25, 2003.

There are no other appeals or interferences known to Appellants, Appellants' representatives or the assignee that will directly affect or be directly affected by, or have a bearing on, the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 1-24 and 76-81 (*see* attached Appendix) are the claims currently on appeal from the final rejections as set forth in the Office Action dated October 8, 2003.

IV. STATUS OF AMENDMENTS

No amendments were filed subsequent to a final rejection.

V. SUMMARY OF THE INVENTION

In a conventional relational database, information is organized into tables consisting of rows and columns (page 1, lines 21-28). These tables are recorded on storage devices, such as a magnetic disk drive (*Id.*). A programming interface, such as a Structured Query Language

¹ A revised Appeal Brief and Submission were filed on December 8, 2003.

² A revised Appeal Brief and Submission were filed on December 30, 2003.

(SQL) programming interface, is used to manipulate the data stored in the database (page 2, lines 3-15).

An index can be used to help retrieve data from the database (page 2, lines 16-23). An index is an ordered set of references to the records or rows of information in a database table (*Id.*). The index includes a key, *i.e.*, a field of the record or an attribute of the row, which is used to access the desired information (*Id.*). Thus, when data is to be retrieved, an index key is used to locate the corresponding records (*Id.*).

It is typically very time consuming to retrieve data from a conventional database and/or file system (page 2, lines 24 to page 3, line 2). For instance, the amount of time required to access data stored within the database and/or file system is adversely affected by the input/output (I/O) subsystem (*Id.*). For example, because the index typically is located on a secondary storage device such as a magnetic disk drive, I/O resources are needed to access the index (page 3, lines 13-15).

A cache is a high speed data storage mechanism that may be implemented as a portion of memory in a computer, wherein data that is to be used more than once may be retrieved from the database and stored in the cache for easy and quick access (page 2, lines 24 to page 3, line 2). However, the cache design can adversely affect the amount of time required to access data stored within the database (*Id.*).

Conventional cache designs also do not guarantee that desired data will be present in memory when needed, which as noted above can lead to delays in retrieving data via an I/O subsystem (*Id.*). For example, a conventional cache is non-persistent, *i.e.*, the data is stored

therein only temporarily (page 3, lines 3-15; Fig. 1). Further still, a conventional cache is generally limited in size (*Id.*). Because of these attributes of the conventional cache, the results of a search may not be found in the cache.

Additionally, a conventional cache typically contains data that has been retrieved in response to prior requests for data (page 3, lines 16-21). However, in many cases, a user will submit a request for data that was not recently retrieved (*Id.*). In these cases, the data is not present in the cache and it must be retrieved via an I/O data subsystem from the database tables held in the slower data store such as a magnetic disk (*Id.*).

In view of the above, the present invention is directed to a method, apparatus and article of manufacture for storing data in a persistent database table held in the memory of a computer: an in-memory database table (*see* claims 1-24 and 76-81; and specification: page 3, line 25 to page 4, line 15). Once a persistent, user-defined, shareable in-memory database table is created and loaded with data, data may be quickly located in and retrieved from the database table by using the conventional database interface, e.g., SQL, and database indexes (page 4, lines 1-3).

For example, at a data server computer 230, in addition to or instead of storing data in a relational database 252 and/or a relational non-persistent cache 240, an in-memory database table 246 may be created (*e.g.*, by a database administrator) and loaded with data (*see* Fig. 2). In this manner, since data desired by a user may be located in the persistent in-memory database tables, the input/output (I/O) processing associated with retrieving data from a data storage device (*e.g.*, the relational database 252 recorded on a magnetic disk) is avoided, thus reducing the time required to access/retrieve the data (page 9, lines 17-23). Additionally, access time for data

stored in an in-memory database table is greatly reduced when compared to conventional non-persistent cache designs, such as cache 240 (page 9, lines 24-29). Furthermore, unlike these non-persistent cache designs, data can be located in a persistent in-memory database table such that the data desired by a user is ensured to always be present in the in-memory database table (page 9, lines 17-18).

VI. ISSUES

The issues on appeal are as follows:

1. Whether or not claims 1, 9 and 17 are patentable over Pereira, U.S. Patent No. 6,122,640 (hereinafter "Pereira") in view of Carper et al., U.S. Patent No. 6,390,374 (hereinafter "Carper"), under 35 U.S.C. § 103(a).
2. Whether or not claims 2-3, 10-11 and 18-19 are patentable over Pereira and Carper, and further in view of Sarkar, U.S. Patent No. 6,012,067 (hereinafter "Sarkar"), under 35 U.S.C. § 103(a).
3. Whether or not claims 4, 8, 12, 16, 20 and 24 are patentable over Pereira and Carper, and further in view of Shaughnessy, U.S. Patent No. 5,692,178 (hereinafter "Shaughnessy"), under 35 U.S.C. § 103(a).
4. Whether or not claims 5, 13 and 21 are patentable over Pereira and Carper, and further in view of Blakeley et al., U.S. Patent No. 5,761,493 (hereinafter "Blakeley"), under 35 U.S.C. § 103(a).

5. Whether or not claims 6, 14 and 22 are patentable over Pereira and Carper, and further in view of Blakely and Meyerzon et al., U.S. Patent No. 6,424,966 (hereinafter "Meyerzon"), under 35 U.S.C. § 103(a).

6. Whether or not claims 7, 15 and 23 are patentable over Pereira and Carper, and further in view of Benedikt et al. U.S. Patent No. 6,202,063 (hereinafter "Benedikt"), under 35 U.S.C. § 103(a).

7. Whether or not claims 76, 78 and 80 are patentable over Pereira and Carper, and further in view of Dugan et al., U.S. Patent No. 6,363,411 (hereinafter "Dugan"), under 35 U.S.C. § 103(a).

8. Whether or not claims 77, 79 and 81 are patentable over Pereira and Carper, and further in view of Farrell, U.S. Patent No. 5,664,153 (hereinafter "Farrell"), under 35 U.S.C. § 103(a).

For at least the exemplary reasons set forth in Section VIII below, Appellants respectfully submit that appealed claims 1-24 and 76-81 are patentable over the aforementioned combinations.

VII. GROUPING OF CLAIMS

The claims do not stand or fall together and arguments for patentability of each group of claims, identified below, are set forth in this brief (*see* Section VIII).

Group I: claims 1, 4-9, 12-17 and 20-24, each of which stand or fall together.

Group II: claims 2-3, 10-11 and 18-19, each of which stand or fall together.

Group III: claims 76, 78 and 80, each of which stand or fall together.

Group IV: claims 77, 79 and 81, each of which stand or fall together.

VIII. ARGUMENTS

Appellants respectfully request the Board to reverse the Examiner's final rejection of the claims pending in the application for at least the following reasons.

1. Claims 1, 9 And 17, Which Are All The Independent Claims, Are Not Rendered Unpatentable Under 35 U.S.C. § 103(a) In View Of Pereira And Carper

Pereira is the primary reference in each of the rejections. It describes reorganizing active DBMS tables, while the tables being organized are available for normal activity (Pereira: Abstract). This reorganization (*i.e.*, rebuilding) of the tables addresses problems such as row migration, fragmentation, row chaining, etc. (Pereira: col. 3, lines 14-33). For example, the reorganization of a database table attempts to reorder the data stored therein, which has become fragmented, or scattered about on the magnetic disk, due to operations such as updating, deleting, etc., into more of a contiguous arrangement on the disk (Pereira: col. 1, line 41 to col. 2, line 38).

The reorganization involves unloading row data from the source table held on disk and loading the row data into a new table also held on disk (Pereira: col. 8, lines 50-57). To facilitate the reorganization, Pereira describes a mapping table mechanism that contains pointers to database rows that are being reorganized. However, Pereira does not disclose or even suggest that the mapping table contains any data from the tables being reorganized. For example, a mapping table is created to map rowids of the source table to rowids of the rows inserted into the new table (*Id.*). Once the reorganization is complete, the new table becomes the source table and the original source table is dropped (Pereira: Abstract). Thus, the mapping table is a temporary

product of the reorganization process and does not even contain the data being reorganized but instead contains only pointers to database rows.

Pereira discloses that the mapping table can be stored in several different locations, such as in a file, in a database management system (DBMS), or in memory (Pereira: col. 9, lines 62-66). Although Pereira discloses that the mapping table can be stored in database management system (DBMS), Pereira does not teach or suggest that the mapping table must be stored in the form of a table in the DMBS (Pereira: col. 9, lines 58-67). And while Pereira discloses that the mapping table can be stored in memory, Pereira neither teaches nor suggests that when storing the mapping table in memory that it is stored in a database table held in memory. On the contrary, Pereira considers a database table as a different type of storage than memory since it lists each as a separate location where the mapping table can be stored (*Id.*).

Carper discloses that having a true operating system (OS) on a smart card facilitates the installation/de-installation of applications on/from the smart card (Carper: Abstract). Generally, a smart card includes various memory types, including RAM, ROM and EEPROM (Carper: col. 2, lines 18-22). Carper discloses a boot application that downloads a new application data object which ultimately is converted to a new application (Carper: col. 6, lines 26-39). To accomplish this, the boot application returns a command table when installed, the commands in the command table allowing for the download of the new application data object (*Id.*). The command table of Carper serves to identify every command executable by the new application (Carper: col. 14, lines 33-43). Carper discloses that command tables and other persistent data

records may be stored and accessed in a file directory using an OS-based file manager (Carper: col. 6, lines 57-60).

Exemplary claim 1 recites, *inter alia*, “creating a persistent in-memory database table” and “loading data into the in-memory database table” (*see also* claims 9 and 17). Exemplary claim 1 stands rejected under § 103(a) as allegedly being unpatentable over Pereira and Carper (*see also* claims 9 and 17).

The Examiner alleges that Pereira teaches “. . . creating a . . . in-memory database table . . .” (*citing* Pereira: col. 2, lines 53-56 and col. 9, lines 62-66) “. . . and loading data into the in-memory database table . . .” (*citing* Pereira: col. 19, lines 43-51 and col. 9, lines 62-66).

To the contrary, as noted above, Pereira describes reorganizing active database management system (DBMS) tables held in secondary storage, such as a magnetic disk, while keeping those DBMS tables available for normal activity (Abstract). The reorganization involves unloading row data from a source table residing on disk and loading the row data into a new table also held on disk, not in memory (Pereira: col. 8, lines 50-57).

The Examiner appears to be confusing Pereira's disclosure of a conventional database table, which is disclosed only as holding data and being stored in secondary storage, such as on a magnetic disk (Pereira: col. 2, lines 53-56; *see also* col. 1, lines 41-48), with Pereira's disclosure of a mapping table, which is disclosed as only holding pointers to the rows in the database tables (Pereira: col. 9, lines 62-66). In Pereira, while blocks from a source table held on disk, which is being reorganized, may be temporarily held in memory until they are inserted into a new table also held on disk, these blocks of data do not represent an in-memory database table but instead

are pieces of data (from a source database table held on disk) to be ordered and inserted into a new database table held on disk (Pereira: Table 6; *see also* col. 1, lines 41-57).

For the reorganization process, Pereira creates a mapping table that maps identifiers of rows (rowids) of the source table to rowids of the rows inserted into the new table (*Id.*). A reorganization process uses that mapping table to facilitate reorganizing the source table, but Pereira neither teaches nor even suggests that the mapping table is organized as a database table. Pereira discloses only that the mapping table contains information regarding where rows are unloaded from the source table and where they are stored in the new table (*Id.*).

In Pereira, there is not even a suggestion that the mapping table should be stored in the form of a database table in memory (*see, e.g.*, Pereira: col. 9, lines 58-67). Indeed, Pereira expressly indicates that the mapping table can be stored as a table on a file system, which teaches away from the step of "loading data into the in-memory database table" (*Id.*). The use of mapping tables, which might reside in memory, does not correspond to storing real portions of a database in memory.

Further still, the Examiner asserts without any support that a table that may be stored in the DBMS is clearly a database table (Office Action: page 10). Based on this unsupported assertion, the Examiner then alleges that since Pereira describes that the mapping table may also be stored in memory, Pereira teaches "an in-memory database table". Appellants respectfully disagree. Pereira merely lists places where the mapping table can be stored, such as in a DBMS, or in a file system or in memory ("the mapping can be stored in the form of a table in the DBMS, in memory, on a file system or [by] any other method in which the mapping table may be

maintained and later used by the reorganization process") (Pereira: col. 9, lines 58-67). The Examiner appears to interpret this portion of Pereira as if it discloses that the mapping table is stored in a "DBMS in memory", but in fact Pereira discloses only that the mapping table is stored in a DBMS or in memory. It is respectfully submitted that Pereira neither teaches nor suggests that the DBMS or any DBMS table is persistently stored in memory. Thus, contrary to the Examiner's position, Pereira fails to teach or suggest "loading data into [an] in-memory database table", as recited in claim 1 (*see also* claims 9 and 17).

In general, a DBMS will store database tables on a random access storage device, such as a magnetic disk drive, and not in memory, so to achieve semi-permanent storage (Specification: page 1, lines 26-28). Indeed, Pereira likewise refers to persistent storage as a disk (Pereira: col. 12, lines 9-10).

The reason for storing the mapping table of Pereira is so that it can be later used during the reorganization process, if necessary (Pereira: col. 9, lines 58-67). Pereira discloses that locating the mapping table outside of memory, *e.g.*, in a file system, will suffice for this purpose (*Id.*). Nowhere does Pereira disclose that the mapping table is to persist beyond the point when the reorganization completes. The mapping table is merely a temporary product of the reorganization process, which does not persist beyond the reorganization process, and thus it does not correspond to a persistent in-memory database table into which data is loaded (*see* claims 1, 9 and 17).

Indeed, the Examiner acknowledges that Pereira fails to teach or suggest an in-memory database table that is persistent (*see* Office Action: page 3). However, the Examiner alleges that

Carper makes up for this acknowledged deficiency of Pereira by disclosing that a command table in memory can be persistent (Carper: col. 14, lines 34-44).

To the contrary, the command table of Carper, like the mapping table of Pereira, is not a database table. Instead, the command table serves to identify commands executable by a new application installed on a smart card (*Id.*). Thus, when a command is received in the operating system, the operating system uses the command table(s) stored in memory in an attempt to identify an application able to execute the command (*Id.*).

Additionally, the Examiner fails to provide any reasonable suggestion or motivation, absent impermissible hindsight, for combining the references. Appellants note that to establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings (*see* MPEP § 2143).

The Federal Circuit has noted that the USPTO is held to a rigorous standard when trying to show that an invention would have been obvious in view of the combination of two or more references. According to the Federal Circuit, "the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references" (*see In re Sang Su Lee*, 61 USPQ2d 1433 (Fed. Cir. 2002), *citing, e.g., In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999)).

Appellants respectfully submit that the current grounds of rejection do not satisfy this standard for demonstrating that the claimed invention would have been obvious in view of the combination of Pereira and Carper.

Specifically, the Examiner takes the position that it would have been obvious to combine the teachings of Pereira and Carper because they all relate in some manner to databases with tables (*see* Office Action, page 10). Indeed, in response to Appellants' prior indication of no suggestion or motivation to combine, the Examiner merely notes that the Pereira and Carper references contain many elements in common, such as the use of computers, the use of tables, the use of memory, the use of indexing, and the creation and updating of data (*see* Office Action, page 10) in an effort to show a motivation to combine the teachings of the references. Appellants respectfully submit that the Examiner's analysis relating to the degree of commonality of elements among the references is incorrect, as it fails to apply the proper standard as set forth in the MPEP (*see, e.g.*, MPEP § 2143.01).³

As noted above, the Examiner acknowledges that Pereira fails to teach or suggest an in-memory database table that is persistent. However, the Examiner alleges that Carper makes up

³ Such a "common elements" approach does not correspond to one of three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art (MPEP § 2143.01). Furthermore, at best, the Examiner is guilty of focusing on the elements that the references have in common to the exclusion of considering their differences. For example, while an airplane and an automobile may have some "elements" in common, *e.g.*, wheels, windows, serving as a form of transportation, etc., they also have many differences beyond the fundamental difference that an automobile travels on the ground and an airplane travels in the air, *e.g.*, rate of travel, type of fuel, required skills of driver/pilot, etc.

for this deficiency of Pereira and that it would have been obvious to combine the teachings of Pereira with the teachings of Carper.

To the contrary, as noted above, the mapping table of Pereira is used only during the reorganization of a DBMS table with no teaching or suggestion of loading data in the mapping table. Carper does not relate to any such table reorganization. Instead, Carper disparately relates to installing/uninstalling applications to/from a smart card or other portable token.

Furthermore, modifying the mapping table of Pereira to be persistent would make no sense because it is only used temporarily, *i.e.*, during the reorganization of a source table held on disk. Indeed, the mapping table serves no use after the source table is replaced by a new (ordered) table held on disk, such that allowing the mapping table to persist after the reorganization process would be a waste of storage. Consequently, the Examiner fails to provide any reasonable motivation for combining the teachings of Pereira with the teachings of Carper, absent the use of impermissible hindsight by the Examiner.

For at least the exemplary reasons set forth above, claims 1, 9 and 17 are patentable over a reasonable combination, if any, of Pereira and Carper, under 35 U.S.C. § 103(a).

2. Claims 2-3, 10-11 And 18-19 Are Not Rendered Unpatentable Under 35 U.S.C. § 103(a) In View Of Pereira, Carper And Sarkar

In rejecting claims 2-3, 10-11 and 18-19 under 35 U.S.C. § 103(a), the Examiner relies on a combination of Pereira and Carper, as applied to claims 1, 9 and 17, and further in view of Sarkar. However, Appellants respectfully submit that Sarkar fails to cure the exemplary deficiencies of Pereira and Carper, as set forth above in Section VIII(1), for claims 1, 9 and 17.

Consequently, claims 2-3, 10-11 and 18-19 are patentable over a reasonable combination, if any, of Pereira, Carper and Sarkar, at least by virtue of their dependency, as well as the additional features set forth below. Furthermore, for at least the reasons set forth above in Section VIII(1) for claims 1, 9 and 17, and in addition to the disparate teachings of Sarkar, Appellants submit that the Examiner fails to provide any reasonable suggestion or motivation, absent impermissible hindsight, for combining Pereira, Carper and Sarkar in the manner proposed.

Sarkar discloses representing and manipulating heterogeneous objects (*e.g.*, text, audio, video, etc.) in relational databases over the Internet (Sarkar: col. 5, lines 11-17). For example, Sarkar discloses using Uniform Resource Locators (URLs) in relational databases to reference any kind of local or remote objects including other relational databases anywhere on the web (Sarkar: col. 5, lines 27-30). In addition to URLs being used as locators for remote database objects, SQL queries are used to uniformly manipulate local and/or remote database tables, attributes and objects (Sarkar: col. 5, lines 62-65).

Exemplary claim 3 recites, *inter alia*, that “the in-memory database table is user-defined” (*see also* claims 11 and 19). The Examiner acknowledges that neither Pereira nor Carper teaches or suggests these features (Office Action: page 3). However, the Examiner alleges that Sarkar makes up for these acknowledged deficiencies of Pereira and Carper (Office Action: page 4).

In particular, the Examiner alleges that Sarkar teaches a “an in-memory database table [that] is user-defined” by describing user-defined routines (*citing* Sarkar: col. 3, lines 34-37). To the contrary, as noted above, Sarkar merely describes a database server that supports user-defined routines (UDRs), such as a function or a procedure written in a high level programming

language (Sarkar: col. 3, lines 15-18 and 33-45). These routines are created by users and are registered in the system such that they can be invoked within an SQL statement or another routine (Sarkar: col. 3, lines 33-45). For example a user can create a function x that takes a set of arguments and returns a set of values, such that the function can be used in an SQL expression (*Id.*). This ability to support user-defined functions and procedures does not teach or suggest allowing a user to define an in-memory database (*see* claims 3, 11 and 19).

For at least the above exemplary reasons, claims 2-3, 10-11 and 18-19 are patentable over a reasonable combination, if any, of Pereira, Carper and Sarkar, under 35 U.S.C. § 103(a).

3. Claims 4, 8, 12, 16, 20 And 24 Are Patentable Over Pereira, Carper And Shaughnessy, Under 35 U.S.C. § 103(a)

In rejecting claims 4, 8, 12, 16, 20 and 24 under 35 U.S.C. § 103(a), the Examiner relies on a combination of Pereira and Carper, as and further in view of Shaughnessy. However, Appellants respectfully submit that Shaughnessy fails to cure the exemplary deficiencies of Pereira and Carper, as set forth above in Section VIII(1), for claims 1, 9 and 17. Consequently, claims 4, 8, 12, 16, 20 and 24 are patentable over a reasonable combination, if any, of Pereira, Carper and Shaughnessy, at least by virtue of their dependency. Furthermore, for at least the reasons set forth above in Section VIII(1) for claims 1, 9 and 17, and in addition to the disparate teachings of Shaughnessy, Appellants submit that the Examiner fails to provide any reasonable suggestion or motivation, absent impermissible hindsight, for combining Pereira, Carper and Shaughnessy in the manner proposed.

For at least the above exemplary reasons, claims 4, 8, 12, 16, 20 and 24 are patentable over a reasonable combination, if any, of Pereira, Carper and Shaughnessy, under 35 U.S.C. § 103(a).

4. Claims 5, 13 And 21 Are Patentable Over Pereira, Carper And Blakeley, Under 35 U.S.C. § 103(a)

In rejecting claims 5, 13 and 21 under 35 U.S.C. § 103(a), the Examiner relies on a combination of Pereira and Carper, as and further in view of Blakeley. However, Appellants respectfully submit that Blakeley fails to cure the exemplary deficiencies of Pereira and Carper, as set forth above in Section VIII(1), for claims 1, 9 and 17. Consequently, claims 5, 13 and 21 are patentable over a reasonable combination, if any, of Pereira, Carper and Blakeley, at least by virtue of their dependency. Furthermore, for at least the reasons set forth above in Section VIII(1) for claims 1, 9 and 17, and in addition to the disparate teachings of Blakeley, Appellants submit that the Examiner fails to provide any reasonable suggestion or motivation, absent impermissible hindsight, for combining Pereira, Carper and Blakeley in the manner proposed.

For at least the above exemplary reasons, claims 5, 13 and 21 are patentable over a reasonable combination, if any, of Pereira, Carper and Blakeley, under 35 U.S.C. § 103(a).

5. Claims 6, 14 And 22 Are Patentable Over Pereira, Carper Blakeley And Meyerzon, Under 35 U.S.C. § 103(a)

In rejecting claims 6, 14 and 22 under 35 U.S.C. § 103(a), the Examiner relies on a combination of Pereira and Carper, as applied to claims 1, 9 and 17, and further in view of Blakeley and Meyerzon. However, Appellants respectfully submit that Blakeley and Meyerzon (alone or in combination) fail to cure the exemplary deficiencies of Pereira and Carper, as set

forth above in Section VIII(1), for claims 1, 9 and 17. Consequently, claims 6, 14 and 22 are patentable over a reasonable combination, if any, of Pereira, Carper, Blakeley and Meyerzon, at least by virtue of their dependency. Furthermore, for at least the reasons set forth above in Section VIII(1) for claims 1, 9 and 17, and in addition to the disparate teachings of Blakeley and Meyerzon, Appellants submit that the Examiner fails to provide any reasonable suggestion or motivation, absent impermissible hindsight, for combining Pereira, Carper, Blakeley and Meyerzon in the manner proposed.

For at least the above exemplary reasons, claims 6, 14 and 22 are patentable over a reasonable combination, if any, of Pereira, Carper, Blakeley and Meyerzon, under 35 U.S.C. § 103(a).

6. Claims 7, 15 And 23 Are Patentable Over Pereira, Carper And Benedikt, Under 35 U.S.C. § 103(a)

In rejecting claims 7, 15 and 23 under 35 U.S.C. § 103(a), the Examiner relies on a combination of Pereira and Carper, as applied to claims 1, 9 and 17, and further in view of Benedikt. However, Appellants respectfully submit that Benedikt fails to cure the exemplary deficiencies of Pereira and Carper, as set forth above in Section VIII(1), for claims 1, 9 and 17. Consequently, claims 7, 15 and 23 are patentable over a reasonable combination, if any, of Pereira, Carper and Benedikt, at least by virtue of their dependency. Furthermore, for at least the reasons set forth above in Section VIII(1) for claims 1, 9 and 17, and in addition to the disparate teachings of Benedikt, Appellants submit that the Examiner fails to provide any reasonable

suggestion or motivation, absent impermissible hindsight, for combining Pereira, Carper and Benedikt in the manner proposed.

For at least the above exemplary reasons, claims 7, 15 and 23 are patentable over a reasonable combination, if any, of Pereira, Carper and Benedikt, under 35 U.S.C. § 103(a).

7. Claims 76, 78 And 80 Are Patentable Over Pereira, Carper And Dugan, Under 35 U.S.C. § 103(a)

In rejecting claims 76, 78 and 80 under 35 U.S.C. § 103(a), the Examiner relies on a combination of Pereira and Carper, as applied to claims 1, 9 and 17, and further in view of Dugan. However, Appellants respectfully submit that Dugan fails to cure the exemplary deficiencies of Pereira and Carper, as set forth above in Section VIII(1), for claims 1, 9 and 17. Consequently, claims 76, 78 and 80 are patentable over a reasonable combination, if any, of Pereira, Carper and Dugan, at least by virtue of their dependency, as well as the additional features set forth below. Furthermore, for at least the reasons set forth above in Section VIII(1) for claims 1, 9 and 17, and in addition to the disparate teachings of Dugan, Appellants submit that the Examiner fails to provide any reasonable suggestion or motivation, absent impermissible hindsight, for combining Pereira, Carper and Dugan in the manner proposed.

Dugan relates to an Intelligent Network architecture including a central administration and resource management system for administering and tracking service resources to a plurality of service nodes capable of telecommunications service processing (Dugan: col. 1, lines 17-22). For example, an intelligent network is designed to perform intelligent call processing services for

any type of call received at a resource complex or switching platform (Dugan: col. 5, line 66 to col. 6, line 22).

Exemplary claim 76 recites that “the persistent in-memory database table remains in memory until a user specifies removal of said persistent in-memory database table” (*see also* claims 78 and 80). The Examiner acknowledges that neither Pereira nor Carper teaches or suggests these features (Office Action: page 8). However, the Examiner alleges that Dugan makes up for these acknowledged deficiencies of Pereira and Carper (*Id.*). In particular, the Examiner cites a passage from Dugan (*see* Dugan: col. 24, lines 59-67) as allegedly making up for the acknowledged deficiencies of Pereira and Carper.

To the contrary, Dugan describes a Service Administration (SA) component 500 that provides for the decommissioning and removing of service components from service nodes in the intelligent network (col. 24, line 33 to col. 25, line 5; and Fig. 5a). Enabling a user to request the removal of a Service Logic Program (SLP), a Service Independent Building Block (SIBB) or a data entity of an intelligent network, as disclosed in Dugan, does not correspond to a user specifying the removal of an otherwise persistent in-memory database table (*see* claims 76, 78 and 80).

For at least the above exemplary reasons, claims 76, 78 and 80 are patentable over a reasonable combination, if any, of Pereira, Carper and Dugan, under 35 U.S.C. § 103(a).

8. Claims 77, 79 And 81 Are Patentable Over Pereira, Carper And Farrell, Under 35 U.S.C. § 103(a)

In rejecting claims 77, 79 and 81 under 35 U.S.C. § 103(a), the Examiner relies on a combination of Pereira and Carper, as applied to claims 1, 9 and 17, and further in view of Farrell. However, Appellants respectfully submit that Farrell fails to cure the exemplary deficiencies of Pereira and Carper, as set forth above in Section VIII(1), for claims 1, 9 and 17. Consequently, claims 77, 79 and 81 are patentable over a reasonable combination, if any, of Pereira, Carper and Farrell, at least by virtue of their dependency, as well as the additional features set forth below. Furthermore, for at least the reasons set forth above in Section VIII(1) for claims 1, 9 and 17, and in addition to the disparate teachings of Farrell, Appellants submit that the Examiner fails to provide any reasonable suggestion or motivation, absent impermissible hindsight, for combining Pereira, Carper and Farrell in the manner proposed.

Farrell is directed to a memory page open/close scheme based on a high order address bit and a likelihood of page access. In Farrell, when a programmer writing a computer program that accesses a page of memory knows that the next memory access is likely to be in the same page of memory, program instructions can be used to indicate whether the next access by the program is likely to be in the same page of memory (Farrell: Abstract).

Exemplary claim 77 recites that "the data remains in the persistent in-memory database table after it is accessed by a first user and is available for access by a second user" (*see also* claims 79 and 81). The Examiner acknowledges that neither Pereira nor Carper teaches or suggests these features (Office Action: page 8). However, the Examiner alleges that Farrell makes up for these acknowledged deficiencies of Pereira and Carper (Office Action: page 9). In

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particular, the Examiner alleges that Farrell makes up for these acknowledged deficiencies by disclosing that overhead wasted when (memory) accesses cross a boundary from one page to another is quite small compared to the overhead saved by correctly leaving the page open after the remaining accesses (*citing* col. 12, lines 17-18 and col. 15, lines 29-32).

To the contrary, as noted above, Farrell is directed to a memory page open/close scheme based on a high order address bit and a likelihood of page access. Farrell in no way teaches or even suggests that data remains in a persistent in-memory database table after it is accessed by a first user such that it is available for access by a second user (*see* claims 77, 79 and 81).

For at least the above exemplary reasons, claims 77, 79 and 81 are patentable over a reasonable combination, if any, of Pereira, Carper and Dugan, under 35 U.S.C. § 103(a).


In conclusion, Appellants respectfully request the members of the Board to reverse the rejections of the appealed claims and to find each of the claims allowable as defining subject matter which is not unpatentable under 35 U.S.C. § 103(a).

The present Brief on Appeal is being filed in triplicate. Unless a check is submitted herewith for the fee required under 37 C.F.R. §1.192(a) and 1.17(c), please charge said fee to Deposit Account No. 19-4880.

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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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APPENDIX

CLAIMS 1-24 AND 76-81 ON APPEAL:

1. A method of storing data in a memory of a computer, comprising:
creating a persistent in-memory database table; and
loading data into the in-memory database table.
2. The method of claim 1, wherein the data is loaded from a relational data store.
3. The method of claim 1, wherein the in-memory database table is user-defined.
4. The method of claim 1, further comprising enabling multiple users to share access to the in-memory database table.
5. The method of claim 1, further comprising dropping the in-memory database table upon receipt of a drop table command.
6. The method of claim 1, further comprising dropping the in-memory database table upon system shutdown.
7. The method of claim 1, further comprising providing a syntax for creating the in-memory database table.

8. The method of claim 1, further comprising limiting access to the in-memory database table.
9. An apparatus for storing data, comprising:
 - a computer having a memory and connected to a data store;
 - one or more computer programs, performed by the computer, for creating a persistent in-memory database table and loading data into the in-memory database table.
10. The apparatus of claim 9, wherein the data is loaded from a relational data store.
11. The apparatus of claim 9, wherein the in-memory database table is user-defined.
12. The apparatus of claim 9, further comprising enabling multiple users to share access to the in-memory database table.
13. The apparatus of claim 9, further comprising dropping the in-memory database table upon receipt of a drop table command.
14. The apparatus of claim 9, further comprising dropping the in-memory database table upon system shutdown.

15. The apparatus of claim 9, further comprising providing a syntax for creating the in-memory database table.

16. The apparatus of claim 9, further comprising limiting access to the in-memory database table.

17. An article of manufacture comprising a program storage medium readable by a computer and embodying one or more instructions executable by the computer to store data in a memory of a computer, comprising:

creating a persistent in-memory database table; and
loading data into the in-memory database table.

18. The article of manufacture of claim 17, wherein the data is loaded from a relational data store.

19. The article of manufacture of claim 17, wherein the in-memory database table is user-defined.

20. The article of manufacture of claim 17, further comprising enabling multiple users to share access to the in-memory database table.

21. The article of manufacture of claim 17, further comprising dropping the in-memory database table upon receipt of a drop table command.

22. The article of manufacture of claim 17, further comprising dropping the in-memory database table upon system shutdown.

23. The article of manufacture of claim 17, further comprising providing a syntax for creating the in-memory database table.

24. The article of manufacture of claim 17, further comprising limiting access to the in-memory database table.

76. The method of claim 1, wherein the persistent in-memory database table remains in memory until a user specifies removal of said persistent in-memory database table.

77. The method of claim 1, wherein the data remains in the persistent in-memory database table after it is accessed by a first user and is available for access by a second user.

78. The apparatus of claim 9, wherein the persistent in-memory database table remains in memory until a user specifies removal of said persistent in-memory database table.

79. The apparatus of claim 9, wherein the data remains in the persistent in-memory database table after it is accessed by a first user and is available for access by a second user.

80. The article of manufacture of claim 17, wherein the persistent in-memory database table remains in memory until a user specifies removal of said persistent in-memory database table.

81. The article of manufacture of claim 17, wherein the data remains in the persistent in-memory database table after it is accessed by a first user and is available for access by a second user.